UF-20DA

Instruction manual



English manual

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Foreword

This manual will help you to use the UF-20DA safely. The UF-20DA is referred to throughout this manual as the ‘product’.

This manual is intended for the operator and assumes no specialist knowledge.

Keep this manual handy

This manual forms part of the product.

- Read this manual carefully before using the product for the first time.
- Follow the instructions and requirements set out in this manual.
- Keep this manual for the product’s entire service life.
- Keep this manual readily available for reference purposes.
- Request a replacement from the manufacturer if this manual is lost or becomes illegible.
- Pass this manual on whenever you sell or otherwise transfer the unit to another party.

Copyright

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Safety

Intended use

When used together with a compatible transmitter, the product forms a wireless audio transmission system. The product is compatible exclusively with the MONACOR products UF-20TB/5 and JSS-20/5. The product is designed for indoor use only and must not be used in damp locations. The product may only be used within the permissible operating temperature range of 0 °C to 40 °C.

Intended use includes reading, understanding and following the instructions set out in this manual.

Any other use is expressly deemed to be unintended use.

Basic safety instructions

Preventing electric shock

- Do not use the product outdoors or in damp locations.
- Connect the product only to a properly installed, earthed socket.

- Connect the product to an easily accessible socket so that it can be quickly disconnected from the mains if a fault occurs.
- Do not use the product in conjunction with an external timer or a separate remote control system.
- Do not place portable multi-way adaptors, extension cables or the power supply units belonging to other devices at the rear of the unit.
- Handle the mains cable only with dry hands.
- Do not kink or pinch the mains cable, route it over sharp edges or damage it in any other way.
- Route the mains cable such that it does not become a tripping hazard.

- Use the product only if the product, mains plug and mains cable are all in proper working order.
- If the product is to remain unused for an extended period of time, unplug the mains plug from the socket.
- Keep the product away from naked flames and hot surfaces.
- Never open the product's housing.
- Contact your local sales partner directly if a fault requiring repair occurs. The contact details can be found on the delivery note or invoice.
- Do not place any containers filled with liquid on the product.
- Disconnect the mains plug from the socket immediately if liquid comes into contact with any of the electrical components.

Preventing hearing damage

Exposure to excessively high volumes can cause irreparable damage to your hearing.

› Avoid prolonged exposure to sound at maximum volume.

Preventing environmental damage

- Dispose of the product and its components in accordance with the regulations in force at the place of use.

Avoid material damage and malfunctions

Preventing damage to the product

› Do not drop the product.
› Avoid impact loads.

Preventing cable breakage

Incorrect handling of cables can cause damage.

› Always pull cables by the plug.

› Never disconnect a plug from a socket or connection point by pulling on the cable.

› Do not kink or crush cables.

Preventing damage caused by incorrect cleaning

Cleaning with harsh cleaning agents can damage the unit.

› For light soiling, use only a soft cloth to clean the unit.

› For heavier soiling, use only mild cleaning agents. Test the cleaning agent on a concealed area first of all to ensure that it does not attack the housing components or buttons.

Preventing damage to the unit due to improper repair

› Never open the unit's housing.

› Have the unit repaired exclusively by qualified personnel.

Design features of the warnings

DANGER	
	**Notices marked DANGER warn of a hazardous situation that will result in death or serious injury.**
WARNING	
	**Notices marked WARNING warn of a hazardous situation that may result in death or serious injury.**
CAUTION	
	**Notices marked CAUTION warn of a situation that may result in minor or moderate injury.**

Design features of the notices regarding property damage

ATTENTION	
	These notices warn of a situation that will result in property damage and impaired functionality.

Description

Task and function

When used together with a compatible transmitter, the product forms a wireless audio transmission system. The product is compatible exclusively with the MONACOR products UF-20TB/5 and JSS-20/5.

The REMOSET® function sets the wireless microphone or pocket transmitter to the transmission frequency selected on the product at the touch of a button over a 2.4 GHz radio signal.

The product operates using True Diversity technology. The signal transmitted by the wireless microphone or pocket transmitter is received by two antennas and amplified in two separate receiver sections. The signal received more strongly at any given moment is then processed further. The range depends on local conditions and is at least 100 m in open areas.

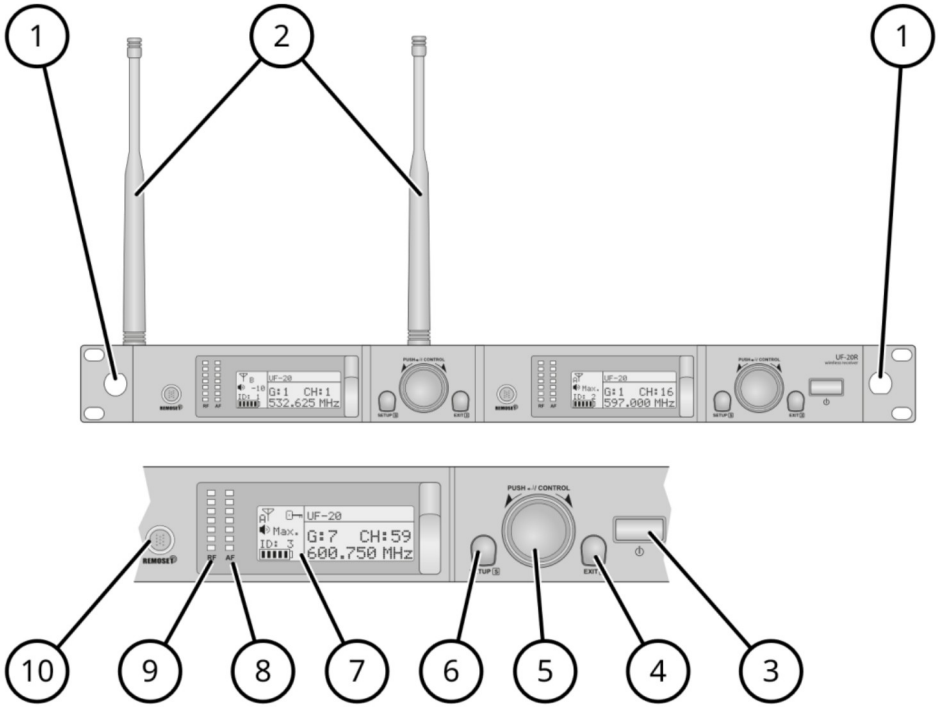
Up to 10 products can be connected to one another.

The product can be placed freely as a desktop unit.

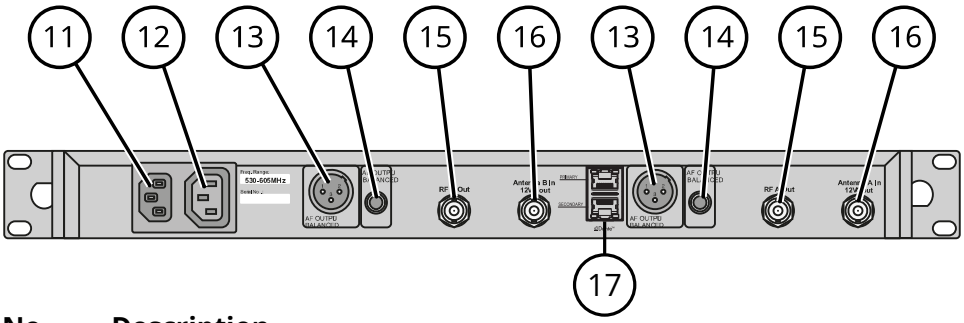
The product can be installed in a rack (482 mm / 19” wide). The product requires one rack unit (1 RU = 44.45 mm) of rack space.

The product has two receiver sections that are identical in terms of connections and operation. Only one receiver section is therefore described below.

Product overview



No.	Description
1	Mounting holes for the RTF-UF20 front-panel connector set
2	Receiving antennas
3	On/Off button
4	EXIT button, for exiting the menu or a submenu
5	PUSH / CONTROL knob, for navigating and selecting menu settings
6	SETUP button, for accessing the settings menu
7	Display
8	AF (audio frequency) indicator for the volume of the received audio signal
9	RF (radio frequency) indicator for the radio signal's received signal strength
10	REMOSET button, for transmitting settings from the product to the wireless microphone or pocket transmitter



No.	Description
11	Power supply socket
12	Power supply socket for connecting another unit
13	Line- or microphone-level audio output (balanced XLR; protected against phantom power)
14	Line-level audio output (balanced 6.3 mm jack)
15	Antenna signal output for connecting another unit
16	BNC socket for the receiving antenna
17	RJ45 sockets for digital audio transmission via Dante

Technical data

Dimensions (W × H × D)	480 mm × 45 mm × 260 mm
Weight	2.9 kg
Carrier frequency range	530–605 MHz
REMOSET frequency	2.4 GHz
Audio frequency range	50–18,000 Hz
XLR output level, balanced	10 mV (Mic) Switchable to 100 mV (Line)
6.3 mm jack output level, balanced	100 mV (Line)
Channels	2
Total harmonic distortion	< 0.5%
Dynamic range	> 108 dB
Operating temperature	0–40 °C
Power supply	100–240 V, 50–60 Hz, max. 25 VA

Storing and transporting the product

› Always transport the product in its original packaging.

› Store the product and its components in a dry place that is protected from direct sunlight.

Setup

Connecting the product

› Insert the two supplied antennas (2) into the antenna sockets (16) and position them vertically.

› Connect the power socket (11) to a mains socket using the supplied cable.

UB-900I antenna amplifiers can be connected in between to increase the range and interference immunity. The amplifiers are supplied with power via the product's antenna sockets (see *page 15).*

The antennas on this product can also be mounted on the front panel using the RTF-UF20 socket set.

› Insert the sockets through the mounting holes (1).

› Screw the sockets firmly in place.

› Connect the sockets to the antenna sockets (16) using the supplied extension cables.

Two audio outputs are available for connecting a downstream device, such as a mixing console or an amplifier.

- XLR panel connector (13):
  Balanced output (protected against phantom power) for connection to a microphone or line input. The output level is switchable (see page 15).
- 6.3 mm jack socket (14):
  Balanced output for connection to a line input.

Placement guidelines

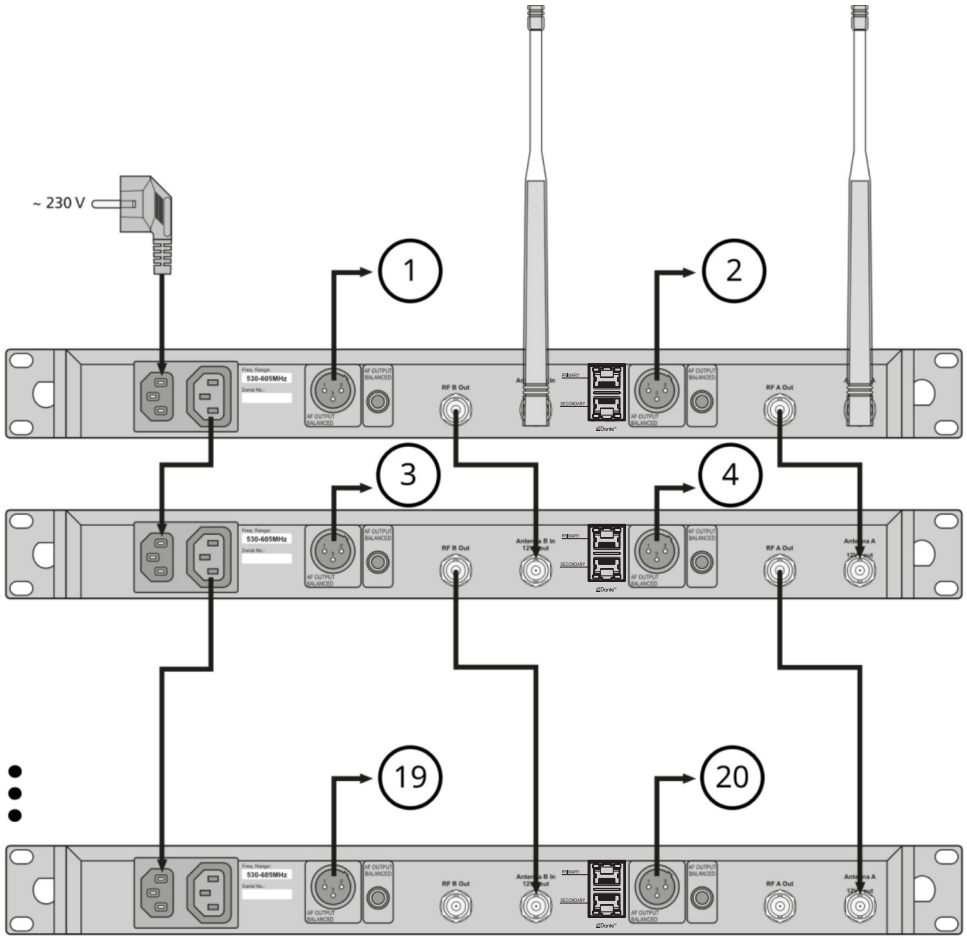
For best reception, keep the receiver and transmitter at least 3 m apart.

Keep the receiver and transmitter at least 50 cm away from other metal objects.

Connecting multiple products

The figure below shows how up to ten products can be interconnected.

Only two antennas and one mains cable are required for this. The two short RF connecting cables are supplied with the product.



No.	Description
1	Audio channel 1
2	Audio channel 2
3	Audio channel 3
4	Audio channel 4
19	Audio channel 19
20	Audio channel 20

Operation

Turn on the unit with the ⏻ button (3). During normal operation, the display (7) lights up orange. If it lights up red and shows an error message periodically, the following may be the cause:

- ⚠ No Signal:
  The wireless microphone or bodypack transmitter is switched off, or is operating on a different transmission frequency from the product (see *page 16).*
- ⚠ Mic. Mute:
  The wireless microphone or bodypack transmitter is muted (refer to its manual).
- ✉ The batteries in the wireless microphone or bodypack transmitter are almost flat.

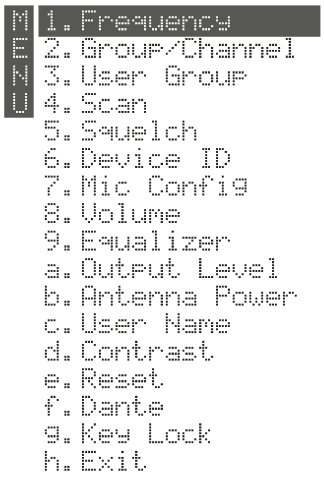
The display shows the following information during normal operation:

Symbol	Description
Y	Shows which antenna (A or B) receives the stronger radio signal. “X” appears when there is no signal.
🔑	Key lock active
🔊	Selected audio output level Mute, −50 to −1, maximum
ID	Product identification number
🔋	Battery level of the wireless microphone or bodypack transmitter. MUTE replaces the battery symbol when the signal is absent or the transmitter is muted.
UF-20	Editable device name (10 characters)
G	Group number (1–15 or U1–U6)
CH	Channel number (1–63, 1–64 in U groups)
MHz	Transmission frequency (530.000–605.000 MHz)

› Press and hold button (3) for two seconds until the display shows POWER OFF.

Menu settings

All settings are made using a menu. The menu navigation is in English and cannot be changed.



› Press and hold the SETUP button (6) for two seconds until the menu appears on the display (7).

The active submenu is highlighted with a coloured background.

› Turn the PUSH / CONTROL knob (5) until the desired menu item is highlighted.

› Press the PUSH / CONTROL knob to open the highlighted submenu.

› Turn the PUSH / CONTROL knob to highlight the desired setting.

› When a submenu is opened, the currently active setting is highlighted. Turn the PUSH / CONTROL knob to highlight the desired setting.

› Press the PUSH / CONTROL knob to open the desired setting.

› If a submenu has several possible settings – for example, group number and channel number – pressing the knob switches from one function to the next.

› Press the SETUP button to save a setting.

The display briefly shows SAVING, then the main menu reappears.

› Press the EXIT button (4) to exit a menu item without making any changes.

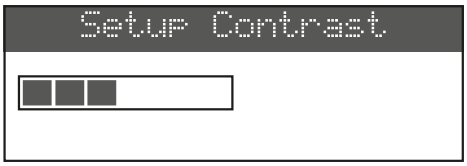
The main menu is displayed again.

› Press the EXIT button or select the ‘h. Exit’ menu item.

› Press the PUSH / CONTROL knob to exit the main menu.

Basic settings

The contrast setting can be changed in the ‘d. Contrast’ menu.



› Turn the PUSH / CONTROL knob to adjust the contrast.

› Save the setting by pressing the SETUP button.

The main menu is displayed again.

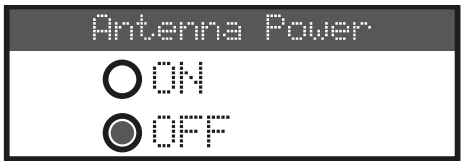
› Press the EXIT button or select the ‘h. Exit’ menu item.

› Press the PUSH / CONTROL knob to exit the main menu.

The output level for the XLR connection (13) can be set coarsely using the ‘a. Output Level’ menu item (line or microphone level).



The antenna inputs are configured ex-works to supply a 12 V operating voltage for antenna amplifiers (e.g. UB-900I). If no antenna amplifier is being used, the 12 V operating voltage should be switched off using the ‘b. Antenna Power’ menu item.



Example with antenna power switched off

A device name (max. 10 characters) that is then shown on the display can be entered for the product in the ‘c. User Name’ menu item.

This makes it easy to distinguish between and assign individual pairs during operation with multiple microphone/receiver pairs.

Once the ‘User Name’ menu item is open, the first character position is selected.



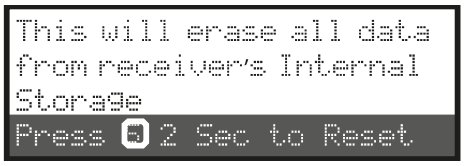
› Turn the PUSH / CONTROL knob until the desired character is highlighted.
› Press the PUSH / CONTROL knob to jump to the next character position.
› Save the name by pressing the SETUP button.

The main menu is displayed again.

Restoring the factory settings (Reset)

› Select the menu item ‘e. Reset’ to reset the product to its factory settings.

A notice is displayed, stating that all stored data will be deleted.



After resetting, check that the device IDs match before using REMOSET again.

› Press the EXIT button to cancel the process.
› Press and hold the SETUP button for two seconds until Erasing ... is displayed to reset the product to its factory settings.

Setting the transmission frequency

Leave the associated wireless microphone (JSS-20/5) or bodypack transmitter (UF-20TB/5) switched off for now. First set the product to an interference-free transmission frequency. There are several ways to do this.

- Set the transmission frequency manually between 530.000 MHz and 605.000 MHz (see page 17).
- For simultaneous operation of multiple audio transmission systems (see page 17), 15 groups are available with up to 63 channels per group (see page 29). Under optimum conditions, all channels in one group can be used at the same time. The scan function identifies channels currently used by other systems (see page 18). These channels are skipped when selecting a channel.
- You can also save preferred frequencies in six custom groups (see page 20), for example when using several audio transmission systems at different venues.

Setting the frequency manually

› Highlight the ‘1. Frequency’ menu item and press the PUSH / CONTROL knob to access the frequency settings.



› Turn the PUSH / CONTROL knob to set the frequency in increments of 1 MHz.

› For precise setting in increments of 0.025 MHz, press the PUSH / CONTROL knob so that the digits after the decimal point are highlighted.

› Turn the PUSH / CONTROL knob.

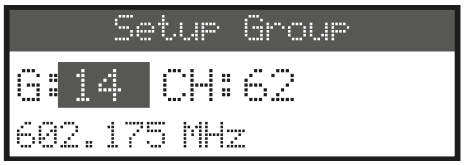
If the frequency matches that of a channel in a group, the group and channel number are shown in the line below.

› Press the SETUP button to save the set frequency.

Selecting a frequency from a group

To operate multiple audio transmission systems simultaneously, select frequencies from one of the 15 groups.

› Highlight the ‘2. Group/Channel’ menu item and press the PUSH / CONTROL knob to access the group and channel selection.



› Turn the PUSH / CONTROL knob to select the group.

› Press the PUSH / CONTROL knob so that the channel number is highlighted.

› Turn the PUSH / CONTROL knob to select the channel.

The corresponding receive frequency is shown in the line below.

› Press the SETUP button to save the settings.

Scan function

Before selecting a transmission channel, the scan function automatically checks whether other transmission systems are transmitting on the product's channels. Occupied channels are skipped when selected.

› Highlight the '4. Scan' menu item and press the PUSH / CONTROL knob to open the scan selection menu.



Either all channels in all groups can be scanned, or only the channels in a single group (see page 29).

Scanning all channels

› Highlight the '1. All Groups' menu item.

› Press the PUSH / CONTROL knob.



› Press the PUSH / CONTROL knob or the SETUP button to start the scan.

The display shows Scanning... %.

The process can be cancelled at any time.

› Press the EXIT button to cancel.

Once scanning is complete, the results list showing all of the free channels is displayed.



Group 1 is selected. The line below shows the number of free channels – in this case, 16 channels. Group 1 has 20 channels in total, so 4 channels are occupied.

› Turn the PUSH / CONTROL knob to select one of the 15 groups.

› Press the PUSH / CONTROL knob to select a free channel.

The channel number is highlighted. Occupied channels are skipped when the knob is turned.

› Press the SETUP button to save the selected channel for receiving.

Scanning channels in a group

› Highlight the ‘4. Scan’ menu item and press the PUSH / CONTROL knob to open the scan selection menu.



› Turn the PUSH / CONTROL knob to select the ‘3. Current Group’ menu item.

› Press the PUSH / CONTROL knob.



› Turn the PUSH / CONTROL knob to select the group.

Scanning a group always begins with the first channel, which is selected automatically.

› Press the PUSH / CONTROL button to check the first channel.

If the channel is free, the display shows ‘OK’ next to the channel number after the check. If the channel is occupied, it is skipped and the next free channel is displayed.

› Press the PUSH / CONTROL knob to check the next channel.

› Press the SETUP button to save the selected channel for receiving.

Saving preferred frequencies

Up to 64 preferred frequencies can be saved in each of the six custom groups.

› Highlight the ‘3. User Group’ menu item and press the PUSH / CONTROL knob to open the following submenu.



› Press the PUSH / CONTROL knob to open the following settings menu.



› Turn the PUSH / CONTROL knob to select the group that the frequency is to be saved under.

› Press the PUSH / CONTROL knob to select the channel number.

› Turn the PUSH / CONTROL knob to select the channel number that the frequency is to be saved under.

› Press the PUSH / CONTROL knob so that the digits before the decimal point in the line below are selected.

› Turn the PUSH / CONTROL knob to set the transmission frequency in increments of 1 MHz.

› Press the PUSH / CONTROL knob so that the digits after the decimal point in the line below are selected.

› Turn the PUSH / CONTROL knob to set the transmission frequency in increments of 0.025 MHz.

› Press the SETUP button to save the selected frequency.

Accessing a channel from a custom group

Channels from custom groups are accessed using the ‘2. Group/Channel’ menu item.

Custom groups are identified by the letter U before the group number. Turning the PUSH / CONTROL knob clockwise displays them after Group 15. Turning it anticlockwise displays them before Group 1.

Deleting a custom group

› Highlight the ‘3. User Group’ menu item and press the PUSH / CONTROL knob to open the following submenu.



› Turn the PUSH / CONTROL knob to select the second menu item, ‘Clear Group’.

› Press the PUSH / CONTROL knob to open the following settings menu.



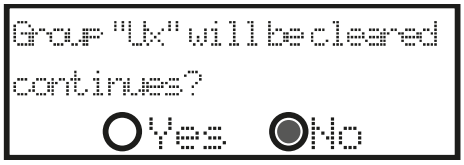
› Turn the PUSH / CONTROL knob to select the group to be deleted.

› Press the PUSH / CONTROL knob.

› Turn the PUSH / CONTROL knob anticlockwise to select ‘Yes’.

› Press the PUSH / CONTROL knob to delete the group.

› Press the EXIT button to cancel the deletion process.



REMOSET function

Transmitting settings to the transmitter

Once the transmission frequency, group and transmission channel have been set on the product, the REMOSET function transmits these settings to the associated transmitter (wireless microphone or pocket transmitter) at the touch of a button. The following conditions must be met:

- Neither the product nor the transmitter must have a menu open.
- The transmitter must be switched on and in the vicinity of the product (REMOSET transmission range approx. 10 m).
- The REMOSET function must not be locked on the transmitter – refer to the transmitter’s manual.

- The transmitter must be set to the same identification number as the product.
- Neither the product nor the transmitter must be locked.
- The transmitter must not be muted.

  If ID checking is disabled on the transmitter, the IDs do not have to match.

Setting the identification number

Each transmitter/product pair must be assigned a different identification number (ID no.) so that the individual pairs do not interfere with one another during the REMOSET transmission.

If only one transmitter/product pair is being used, the default ID no. 1 can be retained.

› Highlight the '6. Device ID' menu item and press the PUSH / CONTROL knob to access the ID no. setting.



› Turn the PUSH / CONTROL knob to set the ID no.

› Press the SETUP button to save the setting.

› Press the EXIT button to hide the main menu.

› Set the same ID no. on the transmitter.

Using the REMOSET transmission function

› Press the REMOSET button (10).

The button flashes rapidly during REMOSET transmission. Once the associated transmitter is configured, the button stays lit.

If the button starts flashing more slowly after about 15 seconds, the transmitter could not be configured automatically.
Press EXIT to stop the button flashing.

Troubleshooting:

› Check that all conditions for transmission are met (see pages 21–22).

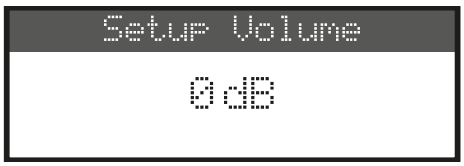
› Check the transmitter settings and correct them if necessary.

› Press the REMOSET button again.

When using multiple units, synchronise them one at a time via REMOSET to avoid interference.
A low transmitter battery level can prevent REMOSET synchronisation.

Setting the output volume

Precision setting of the volume for both audio outputs (13 and 14) is performed jointly using the ‘8. Volume’ menu item.



To achieve a high signal-to-noise ratio, set the microphone sensitivity on the wireless microphone or pocket transmitter as high as possible and the volume on the product correspondingly lower.

Equalizer

› Highlight the ‘9. Equalizer’ menu item and press the PUSH / CONTROL knob to attenuate low frequencies or boost high frequencies.



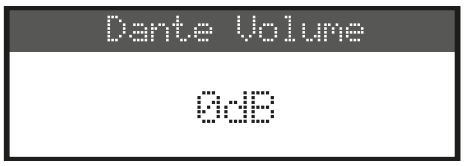
› Turn the PUSH / CONTROL knob to select the setting.

Symbol	Description
—	No effect
⌐—	Bass attenuated
—⌐	Treble boosted
⌐⌐	Bass attenuated and treble boosted

› Press the SETUP button to save the setting.

Dante

› Highlight the ‘f. Dante’ menu item and press the PUSH / CONTROL knob to set the volume in the ‘Volume’ submenu.

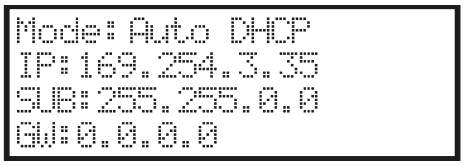


Volume: −50 to 0 dB.
Left: volume and network.
Right: Dante volume only.

› Turn the PUSH / CONTROL knob to change the volume setting.

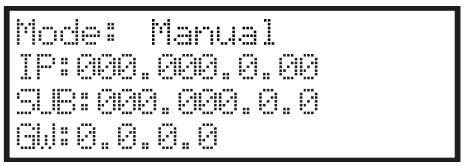
› Press the SETUP button to save the set value.

› Highlight the ‘f. Dante’ menu item and press the PUSH / CONTROL knob to change the network setting in the ‘Network’ submenu.



DHCP requires a router with an active DHCP server on the network.

› Press the PUSH / CONTROL knob to switch between ‘DHCP’ and ‘Manual’.



The Dante module restarts when the mode or IP address changes. It takes a few seconds to be ready again.

› In ‘Manual’ mode, press the PUSH / CONTROL knob to move to the next field.

› Turn the PUSH / CONTROL knob to enter the values.

› Press the SETUP button to save the set values.

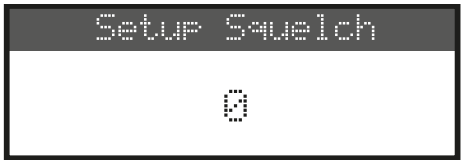
Squelch

The squelch function mutes the product during pauses in speech or singing when the level of received interference is below an adjustable threshold.

A higher threshold also reduces the transmission range, since the product mutes when the transmitter’s radio signal falls below the selected threshold.

Use a higher threshold when reception is good. Use a lower value when the transmitter is farther from the product.

› Highlight “5. Squelch” and press the PUSH / CONTROL knob to open the squelch settings.



› Turn the PUSH / CONTROL knob to set the threshold.

0	Default setting
1 to +10	When reception is good
−1 to −5	At greater distances

› Press SETUP to save the setting.

Configuring transmitter settings from the product

Use “7. Mic Config” to configure the following settings for the JSS-20/5 wireless microphone or UF-20TB/5 bodypack transmitter from the product.

Submenu item	**Setting**	**JSS-20/5**	**UF-20TB/5**
Sensitivity	Microphone sensitivity −15 to +15 dB	x	x
Attenuate	Reduce sensitivity by an additional 20 dB	—	x
LowCut	Low-cut filter on/off	x	x
RF Power	Transmit power 10/50 mW	x	x
KeyLock	Key lock on/off	x	x
Remoset Config	Select settings to transmit	x	x

› Turn the PUSH / CONTROL knob to select the function to configure.

› Press the PUSH / CONTROL knob.

› Turn the PUSH / CONTROL knob to change the setting.

› Press the PUSH / CONTROL knob to save the setting.

› In “Remoset Config”, select the settings to transmit to the transmitter via REMOSET.

› Press the PUSH / CONTROL knob to select or deselect the function.

Symbol	Description
◉	Setting will be transmitted
☐	Setting will not be transmitted

› Press the REMOSET button to transmit the settings.

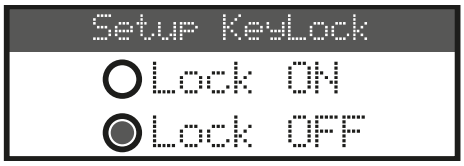
Select at least one setting to use REMOSET.

Key lock

Activate the key lock to prevent accidental changes to the product settings.

Activating the key lock

› Highlight “g. Key Lock” and press the PUSH / CONTROL knob to open the lock function.



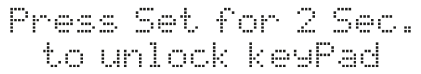
Left: locks REMOSET, SETUP, the control knob and EXIT.

Right: also locks the On/Off button.

› Turn the PUSH / CONTROL knob to activate the lock.

› Press SETUP to save the setting.

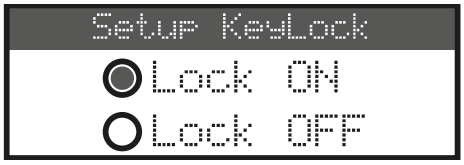
This message appears when you press any button on the product.



When the key lock is active and the menu is hidden, the display shows 🗝.

Deactivating the key lock

› Press and hold SETUP for two seconds to open the “Setup KeyLock” menu.



› Turn the PUSH / CONTROL knob to deactivate the lock.

› Press SETUP to save the setting.

Disposal

The outer packaging is recyclable.

› Dispose of packaging materials at the end of their service life in accordance with the regulations applicable in your country or at your location.



Electrical and electronic equipment marked with this symbol must not be disposed of together with household waste. Such equipment may contain hazardous substances that are harmful to the environment.

› Dispose of the product in accordance with the regulations applicable in your country or at your location.

› Contact your local authorities or your dealer if you have any further questions or require further information about disposing of your product.

Declarations of conformity

The product complies with Directive 2014/53/EU.

The EU Declaration of Conformity is available at:
https://www.jts-europe.de

The 530–605 MHz frequency range that the product operates within has been generally allocated in Germany for the professional use of wireless microphones.

Operation of the products in Germany requires no registration and is free of charge. Further information can be found at:
https://www.bundesnetzagentur.de/vfg34

At the time of publication, there are restrictions or special requirements in place in the following countries:

- Czechia
- Greece
- Finland
- France
- Italy
- Lithuania
- Malta
- Poland

› Always comply with the regulations of the country that you are using the products in.

› Before operating the products outside of Germany, contact the MONACOR subsidiary or the relevant authority in the country in question.

Links to the national authorities can be found at the following web address:
https://www.cept.org > ECC > Topics > Other spectrum topics: SRD Regulations and indicative list of equipment subclasses > EFIS and National Frequency Tables

Transmission frequencies

Group 1		Group 2		Group 3		Group 4	
CH 1	532.625	CH 1	530.375	CH 1	531.250	CH 1	531.500
CH 2	535.500	CH 2	531.875	CH 2	535.250	CH 2	532.375
CH 3	539.000	CH 3	535.375	CH 3	536.750	CH 3	533.375
CH 4	541.000	CH 4	537.625	CH 4	544.750	CH 4	534.250
CH 5	546.125	CH 5	538.375	CH 5	546.125	CH 5	535.375
CH 6	550.500	CH 6	539.500	CH 6	553.000	CH 6	536.250
CH 7	553.500	CH 7	546.125	CH 7	554.625	CH 7	536.750
CH 8	558.125	CH 8	552.500	CH 8	559.000	CH 8	537.500
CH 9	562.375	CH 9	558.125	CH 9	560.250	CH 9	538.500
CH 10	564.250	CH 10	561.375	CH 10	562.125	CH 10	539.000
CH 11	565.125	CH 11	568.750	CH 11	573.625	CH 11	539.875
CH 12	569.125	CH 12	572.750	CH 12	579.750	CH 12	540.875
CH 13	574.750	CH 13	579.000	CH 13	583.375	CH 13	541.375
CH 14	576.375	CH 14	582.375	CH 14	586.375	CH 14	542.125
CH 15	593.625	CH 15	589.500	CH 15	589.750	CH 15	543.875
CH 16	597.000	CH 16	590.500	CH 16	595.125	CH 16	544.750
CH 17	601.500	CH 17	595.625	CH 17	595.625	CH 17	545.875
CH 18	603.000	CH 18	600.375	CH 18	598.375	CH 18	547.625
CH 19	603.625	CH 19	602.375	CH 19	600.125	CH 19	549.125
CH 20	604.750	CH 20	604.000	CH 20	600.875	CH 20	550.750
		Ch 21	604.875	CH 21	603.000	CH 21	551.750
						CH 22	552.875
						CH 23	553.375
						CH 24	554.500
						CH 25	556.500
						CH 26	557.000
						CH 27	558.625
						CH 28	561.750
						CH 29	562.375
						CH 30	567.875
						CH 31	568.375
						CH 32	569.375
						CH 33	569.875
						CH 34	573.500
						CH 35	575.375
						CH 36	576.875
						CH 37	579.000

Group 1		Group 2		Group 3		Group 4	
						CH 38	579.500
						CH 39	580.375
						CH 40	583.750
						CH 41	584.750
						CH 42	589.125
						CH 43	587.375
						CH 44	587.875
						CH 45	592.250
						CH 46	593.000
						CH 47	594.750
						CH 48	595.500
						CH 49	600.625

Group 5		Group 6		Group 7		Group 8	
CH 1	531.225	CH 1	531.225	CH 1	531.825	CH 1	531.975
CH 2	532.050	CH 2	532.575	CH 2	533.025	CH 2	533.025
CH 3	532.575	CH 3	533.250	CH 3	533.925	CH 3	533.850
CH 4	533.175	CH 4	534.900	CH 4	534.750	CH 4	534.600
CH 5	533.850	CH 5	535.425	CH 5	535.875	CH 5	535.275
CH 6	534.600	CH 6	537.150	CH 6	537.375	CH 6	536.025
CH 7	535.500	CH 7	537.975	CH 7	537.900	CH 7	538.050
CH 8	536.700	CH 8	538.500	CH 8	539.625	CH 8	539.100
CH 9	538.125	CH 9	539.100	CH 9	540.150	CH 9	540.300
CH 10	539.625	CH 10	540.375	CH 10	541.500	CH 10	542.100
CH 11	540.375	CH 11	541.125	CH 11	542.475	CH 11	543.150
CH 12	541.575	CH 12	542.175	CH 12	543.225	CH 12	543.750
CH 13	542.850	CH 13	542.850	CH 13	544.050	CH 13	545.550
CH 14	544.725	CH 14	544.125	CH 14	544.575	CH 14	548.100
CH 15	545.775	CH 15	546.225	CH 15	545.175	CH 15	549.150
CH 16	547.725	CH 16	546.750	CH 16	546.450	CH 16	549.975
CH 17	548.625	CH 17	548.025	CH 17	547.350	CH 17	550.500
CH 18	550.425	CH 18	549.075	CH 18	548.100	CH 18	551.100
CH 19	551.025	CH 19	550.500	CH 19	548.775	CH 19	551.775
CH 20	552.675	CH 20	551.175	CH 20	549.375	CH 20	552.525
CH 21	553.200	CH 21	552.225	CH 21	549.900	CH 21	553.425
CH 22	554.625	CH 22	554.100	CH 22	552.075	CH 22	554.625
CH 23	555.225	CH 23	555.225	CH 23	552.675	CH 23	555.675
CH 24	557.100	CH 24	556.575	CH 24	553.875	CH 24	558.675
CH 25	558.075	CH 25	557.475	CH 25	555.900	CH 25	559.350
CH 26	559.725	CH 26	558.000	CH 26	556.500	CH 26	559.875
CH 27	560.400	CH 27	560.025	CH 27	558.750	CH 27	562.425
CH 28	561.900	CH 28	561.525	CH 28	560.025	CH 28	563.325
CH 29	562.575	CH 29	562.950	CH 29	562.350	CH 29	564.375
CH 30	563.025	CH 30	563.625	CH 30	563.250	CH 30	564.900
CH 31	565.800	CH 31	564.975	CH 31	564.075	CH 31	565.650
CH 32	566.625	CH 32	565.800	CH 32	566.100	CH 32	567.675
CH 33	567.150	CH 33	566.700	CH 33	566.700	CH 33	568.575
CH 34	568.350	CH 34	567.525	CH 34	567.525	CH 34	570.750
CH 35	570.300	CH 35	568.500	CH 35	569.175	CH 35	571.725
CH 36	571.650	CH 36	570.000	CH 36	569.700	CH 36	572.850
CH 37	572.700	CH 37	572.325	CH 37	571.350	CH 37	573.900
CH 38	574.200	CH 38	573.750	CH 38	572.475	CH 38	574.500

Group 5		Group 6		Group 7		Group 8	
CH 39	575.325	CH 39	575.100	CH 39	574.500	CH 39	576.825
CH 40	576.000	CH 40	575.775	CH 40	576.225	CH 40	577.725
CH 41	576.900	CH 41	576.675	CH 41	577.275	CH 41	578.850
CH 42	577.725	CH 42	578.550	CH 42	578.475	CH 42	580.575
CH 43	579.150	CH 43	579.750	CH 43	580.275	CH 43	581.400
CH 44	579.900	CH 44	580.725	CH 44	581.250	CH 44	582.450
CH 45	580.800	CH 45	582.975	CH 45	583.350	CH 45	584.025
CH 46	581.850	CH 46	584.175	CH 46	584.250	CH 46	585.525
CH 47	584.250	CH 47	584.925	CH 47	585.975	CH 47	586.500
CH 48	586.050	CH 48	586.275	CH 48	586.500	CH 48	588.225
CH 49	586.725	CH 49	587.325	CH 49	587.475	CH 49	590.175
CH 50	587.550	CH 50	588.225	CH 50	588.300	CH 50	590.775
CH 51	589.275	CH 51	588.900	CH 51	590.325	CH 51	591.900
CH 52	590.700	CH 52	590.325	CH 52	591.525	CH 52	592.650
CH 53	592.350	CH 53	591.375	CH 53	592.125	CH 53	594.075
CH 54	593.325	CH 54	591.900	CH 54	594.075	CH 54	594.750
CH 55	594.225	CH 55	594.225	CH 55	595.275	CH 55	595.650
CH 56	595.650	CH 56	595.125	CH 56	596.100	CH 56	597.675
CH 57	596.250	CH 57	596.400	CH 57	597.375	CH 57	598.575
CH 58	598.050	CH 58	596.925	CH 58	599.925	CH 58	599.550
CH 59	598.725	CH 59	597.750	CH 59	600.750	CH 59	601.050
CH 60	600.300	CH 60	599.175	CH 60	601.950	CH 60	601.725
CH 61	601.425	CH 61	600.300	CH 61	602.850		
CH 62	602.175	CH 62	601.725				
		CH 63	602.400				

Group 9		Group 10		Group 11		Group 12	
CH 1	531.525	CH 1	532.125	CH 1	532.275	CH 1	531.975
CH 2	532.800	CH 2	533.250	CH 2	533.250	CH 2	532.650
CH 3	533.775	CH 3	533.850	CH 3	533.775	CH 3	533.475
CH 4	535.050	CH 4	534.825	CH 4	534.825	CH 4	534.675
CH 5	536.250	CH 5	536.025	CH 5	535.575	CH 5	535.575
CH 6	537.750	CH 6	537.675	CH 6	537.675	CH 6	536.550
CH 7	538.350	CH 7	538.725	CH 7	538.200	CH 7	537.825
CH 8	540.300	CH 8	539.550	CH 8	539.550	CH 8	539.025
CH 9	541.200	CH 9	541.350	CH 9	541.275	CH 9	540.375
CH 10	541.800	CH 10	541.875	CH 10	542.775	CH 10	542.700
CH 11	543.450	CH 11	543.525	CH 11	543.975	CH 11	543.225
CH 12	544.500	CH 12	544.425	CH 12	544.725	CH 12	544.350
CH 13	545.325	CH 13	546.000	CH 13	545.250	CH 13	545.850
CH 14	546.300	CH 14	546.525	CH 14	547.125	CH 14	548.025
CH 15	547.650	CH 15	547.425	CH 15	548.550	CH 15	549.975
CH 16	549.375	CH 16	548.775	CH 16	549.675	CH 16	550.500
CH 17	550.050	CH 17	550.200	CH 17	550.650	CH 17	551.850
CH 18	551.550	CH 18	550.800	CH 18	551.325	CH 18	554.325
CH 19	552.225	CH 19	552.075	CH 19	551.925	CH 19	555.900
CH 20	555.150	CH 20	553.650	CH 20	553.800	CH 20	557.400
CH 21	555.975	CH 21	554.850	CH 21	555.975	CH 21	558.075
CH 22	556.500	CH 22	556.575	CH 22	557.775	CH 22	558.825
CH 23	557.100	CH 23	557.250	CH 23	558.300	CH 23	559.875
CH 24	558.375	CH 24	558.375	CH 24	559.200	CH 24	561.525
CH 25	559.425	CH 25	559.425	CH 25	560.850	CH 25	562.875
CH 26	560.175	CH 26	559.950	CH 26	561.450	CH 26	565.050
CH 27	560.850	CH 27	561.150	CH 27	562.125	CH 27	565.575
CH 28	561.825	CH 28	561.825	CH 28	562.650	CH 28	566.250
CH 29	563.100	CH 29	562.575	CH 29	564.000	CH 29	567.075
CH 30	564.450	CH 30	563.475	CH 30	566.250	CH 30	568.500
CH 31	565.500	CH 31	564.750	CH 31	567.300	CH 31	569.550
CH 32	566.925	CH 32	565.350	CH 32	568.125	CH 32	570.900
CH 33	567.750	CH 33	565.875	CH 33	568.650	CH 33	572.175
CH 34	568.425	CH 34	566.700	CH 34	569.250	CH 34	573.150
CH 35	568.950	CH 35	569.400	CH 35	570.525	CH 35	573.825
CH 36	571.125	CH 36	570.450	CH 36	571.425	CH 36	574.575
CH 37	572.475	CH 37	572.550	CH 37	572.175	CH 37	575.625
CH 38	574.125	CH 38	574.800	CH 38	572.850	CH 38	576.900

Group 9		Group 10		Group 11		Group 12	
CH 39	575.175	CH 39	576.000	CH 39	573.450	CH 39	577.500
CH 40	575.925	CH 40	576.525	CH 40	574.875	CH 40	578.025
CH 41	576.600	CH 41	577.350	CH 41	577.425	CH 41	578.850
CH 42	578.100	CH 42	578.925	CH 42	578.550	CH 42	581.775
CH 43	579.675	CH 43	579.600	CH 43	579.150	CH 43	582.450
CH 44	581.775	CH 44	581.100	CH 44	581.925	CH 44	583.950
CH 45	583.500	CH 45	581.700	CH 45	583.125	CH 45	584.625
CH 46	584.025	CH 46	583.350	CH 46	583.800	CH 46	586.350
CH 47	585.600	CH 47	585.450	CH 47	585.825	CH 47	587.700
CH 48	588.150	CH 48	586.500	CH 48	588.000	CH 48	588.675
CH 49	589.650	CH 49	587.925	CH 49	589.575	CH 49	589.500
CH 50	590.775	CH 50	588.675	CH 50	590.775	CH 50	590.550
CH 51	591.300	CH 51	590.625	CH 51	591.750	CH 51	592.200
CH 52	593.625	CH 52	592.725	CH 52	592.650	CH 52	592.800
CH 53	594.975	CH 53	593.775	CH 53	593.625	CH 53	593.700
CH 54	595.725	CH 54	594.525	CH 54	594.900	CH 54	595.650
CH 55	597.450	CH 55	595.575	CH 55	596.100	CH 55	596.250
CH 56	598.425	CH 56	596.550	CH 56	597.975	CH 56	597.750
CH 57	599.325	CH 57	597.600	CH 57	598.650	CH 57	598.950
CH 58	600.525	CH 58	599.175	CH 58	599.175	CH 58	600.225
CH 59	601.350	CH 59	600.225	CH 59	600.750	CH 59	601.200
CH 60	602.025	CH 60	601.725	CH 60	601.875	CH 60	602.475
		CH 61	602.400				

Group 13		Group 14		Group 15	
CH 1	532.275	CH 1	531.150	CH 1	531.600
CH 2	532.950	CH 2	532.050	CH 2	532.275
CH 3	534.450	CH 3	533.250	CH 3	533.700
CH 4	535.425	CH 4	534.075	CH 4	534.825
CH 5	536.325	CH 5	536.625	CH 5	536.250
CH 6	538.350	CH 6	537.900	CH 6	537.075
CH 7	539.250	CH 7	538.725	CH 7	537.600
CH 8	539.925	CH 8	539.925	CH 8	538.875
CH 9	541.350	CH 9	541.875	CH 9	539.775
CH 10	542.100	CH 10	542.475	CH 10	542.100
CH 11	543.225	CH 11	543.675	CH 11	542.625
CH 12	543.825	CH 12	545.700	CH 12	543.675
CH 13	545.775	CH 13	546.525	CH 13	545.100
CH 14	547.500	CH 14	547.500	CH 14	545.775
CH 15	548.475	CH 15	548.025	CH 15	546.675
CH 16	549.975	CH 16	549.750	CH 16	547.725
CH 17	551.550	CH 17	550.650	CH 17	549.075
CH 18	552.150	CH 18	552.750	CH 18	549.825
CH 19	553.425	CH 19	553.725	CH 19	551.025
CH 20	555.150	CH 20	555.525	CH 20	553.275
CH 21	556.275	CH 21	556.725	CH 21	554.250
CH 22	557.175	CH 22	557.775	CH 22	555.450
CH 23	559.500	CH 23	559.050	CH 23	557.325
CH 24	560.100	CH 24	561.525	CH 24	558.225
CH 25	561.150	CH 25	562.650	CH 25	558.900
CH 26	562.275	CH 26	564.300	CH 26	560.250
CH 27	563.250	CH 27	564.825	CH 27	561.675
CH 28	565.425	CH 28	566.475	CH 28	564.000
CH 29	566.325	CH 29	567.300	CH 29	565.500
CH 30	568.350	CH 30	567.900	CH 30	566.475
CH 31	569.100	CH 31	569.925	CH 31	567.300
CH 32	569.625	CH 32	570.750	CH 32	568.200
CH 33	570.675	CH 33	571.650	CH 33	569.025
CH 34	571.575	CH 34	573.975	CH 34	570.375
CH 35	574.125	CH 35	574.800	CH 35	571.050
CH 36	574.650	CH 36	575.250	CH 36	572.475
CH 37	575.325	CH 37	577.500	CH 37	573.975
CH 38	577.875	CH 38	578.100	CH 37	576.000

Group 13		Group 14		Group 15	
CH 39	578.325	CH 39	580.125	CH 39	576.525
CH 40	579.375	CH 40	581.325	CH 40	577.425
CH 41	580.575	CH 41	581.925	CH 41	578.775
CH 42	581.475	CH 42	584.100	CH 42	579.900
CH 43	582.225	CH 43	584.625	CH 43	581.775
CH 44	582.900	CH 44	585.225	CH 44	582.825
CH 45	583.500	CH 45	585.900	CH 45	583.500
CH 46	584.025	CH 46	586.650	CH 46	584.925
CH 47	584.850	CH 47	587.550	CH 47	585.975
CH 48	585.900	CH 48	588.825	CH 48	587.250
CH 49	588.450	CH 49	589.425	CH 49	587.775
CH 50	590.250	CH 50	589.950	CH 50	589.875
CH 51	590.850	CH 51	590.775	CH 51	591.150
CH 52	591.900	CH 52	591.525	CH 52	591.825
CH 53	593.700	CH 53	592.500	CH 53	592.875
CH 54	594.450	CH 54	593.850	CH 54	593.625
CH 55	595.950	CH 55	594.375	CH 55	594.900
CH 56	597.975	CH 56	596.100	CH 56	595.500
CH 57	598.725	CH 57	596.625	CH 57	596.025
CH 58	599.400	CH 58	598.125	CH 58	596.850
CH 59	600.150	CH 59	599.250	CH 59	598.575
CH 60	600.975	CH 60	600.075	CH 60	599.100
CH 61	602.025	CH 61	600.975	CH 61	600.750
		CH 62	602.175	CH 62	601.425
				CH 63	602.775