

DATE 1 March 1962

SHEET 1 OF

TMC SPECIFICATION NO. S - 662

DWC

DWC

COMPILED

CHECKED

TITLE: DDR-5 (AN/FRR-60(V) RECEIVER

[Signature]
APPROVED

TECHNICAL SPECIFICATION

GENERAL TECHNICAL SPECIFICATIONS

FREQUENCY RANGE:

2 to 32 mc in 100 cps steps (AFC disabled)
2 to 32 mc continuous coverage with AFC.

MODES OF OPERATION:

SSB, ISB, AM, Pulse, Phase, CW, MCW, FSK, FAX, with appropriate adapters.

STABILITY:
(AFC disabled)

Synthesizer controlled 1 part in 10^8 per day for a change in ambient of 15° C. within the limits of 0 to 50° C.

INPUT IMPEDANCE:

Nominally 50 ohms.

INTERNAL STANDARD:

1 mc with a built-in phase comparator circuit for netting to the station master.

DELAYED A.F.C.:

Automatically synchronizes to a received signal which is ± 50 cps in error and suppressed 20 db and to remain synchronized for ± 1000 cps of drift at a maximum drift rate of 10 cps per second.

TUNING:

Accomplished by means of detented switches and an RF tuning control. The signal frequency is displayed by digital readout of 1" high illuminated letters.

SENSITIVITY/NOISE RATIO:

6 db or better over the band i.e. with a 1 microvolt signal and a 7.5 kc bandwidth the output signal to noise ratio is 15 db or better.

INTERMODULATION:

Intermodulation products are down 60 db from the maximum tone in the desired sideband as a result of two signals in the unwanted sideband.

AF DISTORTION:

1% - Intermodulation products down 40 db through the audio channels.

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SELECTIVITY:

Fixed IF bandwidth of 15 kc with seven optional bandwidths selected from the following:

- 1-250 to 7500 cps USB \pm 1.5 db
- 2-250 to 7500 cps LSB \pm 1.5 db
- 3-250 to 3500 cps USB \pm 1.5 db
- 4.250 to 3500 cps LSB \pm 1.5 db
- 5-250 to 6000 cps USB \pm 1.5 db
- 6-250 to 6000 cps LSB \pm 1.5 db
- 7-1-kc symmetrical \pm 1.5 db
- 8-6-kc symmetrical \pm 1.5 db

OUTPUT:

- 1) Four 600 ohm balanced and center tapped output terminals per receiver channel.
 - a) Two independent 0-1 milliwatt output terminals.
 - b) Two independent 0.1 watt output terminals.
- 2) Two IF outputs (single ended at 50 ohm)

OVER-ALL A. F. RESPONSE:

\pm 1.5 db 250 cps to 7,500 cps. Band-pass dependent on the filter selected. Output adjustable from 0 to 1 watt.

IMAGE AND SPURIOUS RESPONSE:

80 db. referenced to 100 microvolt input signal.

A.G.C.:

No more than 3 db change in output for 100 db change in input within the input voltage range of 1 microvolt to .1 volt. The A.G.C. time constant is controlled from the front panel. A.G.C. externally available for diversity operation.

PEAK NOISE LIMITER:

Improved noise limiter for AM,SSB, pulse and phase type information.

METERINGS:

Input signal to the receiver and all audio outputs are metered. Other meters are: AFC drift, carrier level, IF output.

PHASE DISTORTION:

System is capable of receiving pulse, phase and digital type information without seriously degrading intelligence when used with special IF amplifier.

HUM LEVEL:

Minimum 50 db at 1 watt of modulated output.

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INTERNAL POWER SUPPLY:	115 or 230 volts at 50 to 60 cps.
TEMPERATURE:	The system will operate from 0° C to 50° C
CALIBRATION:	An internally generated alignment signal is available on demand for RF tuning and receiver sensitivity checks.
MOUNTING:	Standard Western Electric relay rack.
WEIGHT:	Approx. 550 lbs.
COMPONENTS AND CONSTRUCTION:	JAN/MIL wherever practicable.
SIZE:	Equipment will mount in 2 standard 19" relay racks in less than 60" of panel space.
MILITARY NOMENCLATURE:	AN/FRR-60(V).

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HFR-1 TECHNICAL SPECIFICATION

INPUT:	72 ohms balanced or unbalanced.
INPUT NOISE FIGURE:	Less than 6 db over entire 2-32 range
OUTPUT:	50 ohms resistive (should be terminated in a 50 ohm resistor).
OUTPUT VOLTAGE:	3.5 milivolts to 350 milivolts.
CALIBRATION:	The input frequency is displayed on a large 10" slide-rule dial to give maximum tuning ease.
FRONT PANEL CONTROLS:	Main tuning and bandswitch knobs and locks. Noise silencer and calibrate control.
METERS:	Input level (AGC voltage) and oscillator sync or control voltage.
POWER INPUT:	6.3 volts and 110 v, 60 cycle AC + 200v, + 150 v, - 105 v DC.
WEIGHT	75 LBS
NOMENCLATURE:	TN-376/WR
TMC INSTRUCTION BOOK NO.:	
COMPONENTS AND CONSTRUCTION:	Equipment manufactured in accordance with JAN specifications wherever practicable.

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HFS-1 TECHNICAL SPECIFICATIONS

INPUT: 3.75 to 33.75 mc at a level not to exceed 10 milivolts.

INPUT IMPEDANCE: 50 ohms resistive.

OUTPUT:

1. \pm 5 volts DC (source impedance is 100.000 ohms) which is proportional to the phase difference between the input signal and the reference oscillator.
2. 1.75 mc, one volt across 50 ohms. With a stability equal to that of the reference standard.
3. 250 kc, 1 volt and 3 volts across 50 ohms. Accuracy and stability is that of the internal standard.
4. 1 mc, 1 volt across 50 ohms. Reference standard output.
5. Audio output from the phase detector (used as an audible indicator of frequency difference between the input signal and the internal reference). (High impedance).

FRONT PANEL CONTROLS: Five detented knobs used to position control frequency (1 mc, 100 kc, 10 kc, 1 kc, and 100 cycle) and tuning switch.

METERS AND INDICATORS: Digital frequency readout, 1 mc, phase comparator and oscillator sync light.

INPUT POWER: + 24 v DC at 1 amp, + 200 volts DC, + 150 volts DC, -105 volts DC, 6.3 volts, 60 cycle AC.

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TECHNICAL SPECIFICATION, MODEL AFC-3

CARRIER SUPPRESSION: Will operate with carrier suppression of 0 db to -30 db.

CARRIER INSERTION: Will provide reconditioned or local carrier output.

INPUT TUNING RANGE: \pm 3 kc electrical bandwidth tuning is provided.

AGC SYSTEM: Provides AGC for external control voltage that is derived from the carrier.

ACCURACY: Less than 1 cycle error over the entire AFC control range.

AFC CHARACTERISTICS: The AFC system will synchronize with a 30 db suppressed carrier which has an error of \pm 50 cps and will follow a maximum drift rate of \pm 10 cps/per second. The system will stay synchronized over a minimum frequency range of \pm 1,000 cps from the center frequency.

AFC CORRECTION: The AFC circuit will maintain accurate frequency control so that the audio output of the associated units will have a residual error of less than 1 cycle of the transmitted intelligence.

DRIFT ALARM: A drift alarm light indicates when the carrier error is greater than \pm 750 cps.

FADE ALARM: A fade alarm circuit is incorporated which provides a visual indication when the carrier is interrupted or fades below a predetermined level. Connections for a remote fade alarm indicator are available on rear apron.

THRESHOLD: A continuously adjustable threshold control is provided on the front panel to reduce the system sensitivity when excess noise is encountered.

METERING:

- A. AFC drift indicator.
- B. Carrier level indicator

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ENVIRONMENT:

Model AFC-3 is designed for continuous duty within a temperature range of 0 to 50 degrees C, and any value of humidity up to 90%.

ORIENTATION:

Any

INPUT POWER:

Approximately 120 watts from SBS-2 or HFP-1 Power Supply

SIZE:

3 1/2" h x 19" w x 17" d.

INSTALLED WEIGHT (Approx.):

15 lbs.

SHIPPING WEIGHT AND CUBE (Approx.)

28 lbs. 1.3 cu. ft.

COMPONENTS AND CONSTRUCTION:

All equipment manufactured in accordance with JAN/MIL specifications wherever practicable.

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TECHNICAL SPECIFICATIONS MODEL HNF-1

INPUT AND OUTPUT IMPEDANCE:	50 ohm coaxial.
IF STABILITY:	Within 5 cycles at 250 kc.
BAND REJECTION:	160 cycles between 1 db points with filter shape factor of 5.1
SIZE:	3 1/2" x 19" x 11"
WEIGHT:	Approximately 12 pounds
POWER REQUIREMENTS:	Obtains operating from DDR-5 Power Supply.

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TECHNICAL SPECIFICATIONS MODEL HFI-1

INPUT FREQUENCY: 1.75 mc (\pm 3 kc when used with the AFC-3).

INPUT IMPEDANCE: 50 ohms.

OUTPUT: 250 kc in a 50 ohm load.

OUTPUT AMPLITUDE: 1 V \pm 1.5 db for the bandpass of the selected filter.

AGC OUTPUT: 0-15 V DC (Dependent on input signal level).

AGC CONTROL: Fast or slow with adjustable release time.

INPUT POWER: 6.3 V AC + 200 V DC - 105 V DC, Obtained from HFP-1.

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TECHNICAL SPECIFICATIONS, MODEL HFA-1

SIGNAL INPUT:

- A. 250 kc (synthesized) 1 volt into 50 ohms.
- B. 250 kc (reconstituted carrier) 1 volt into 50 ohms.
- C. 250 kc (modulated 80%) 1 volt into 50 ohms.

POWER INPUT:

B+, B- and filament power provided by Model HFP-1 to connector on rear apron.

AUDIO RESPONSE:

+ 1.5 db, 50 to 8000 cps per channel at 1 watt output.

DISTORTION:

Intermodulation and harmonic distortion at least 40 db down from 1 watt output.

HUM LEVEL:

At least 50 db below 1 watt output.

METERING:

Independent VU meters for monitoring low level 600 ohm channels.

OUTPUT:

- A. 2 independent 0 - 1 watt output channels balanced or unbalanced (high level) 600 ohms.
- B. 2 independent 0 - 1 milliwatt metered outputs balanced or unbalanced (low level) 600 ohms.
- C. 2 independent 0 - 1 watt output terminals for 4, 8, 16 ohms unbalanced.

SIZE:

7" x 19" x 17"

POWER CONSUMPTION:

70 watts.

WEIGHT:

20 lbs.

COMPONENTS AND CONSTRUCTION:

All equipment manufactured in accordance with JAN/MIL specifications wherever practicable.