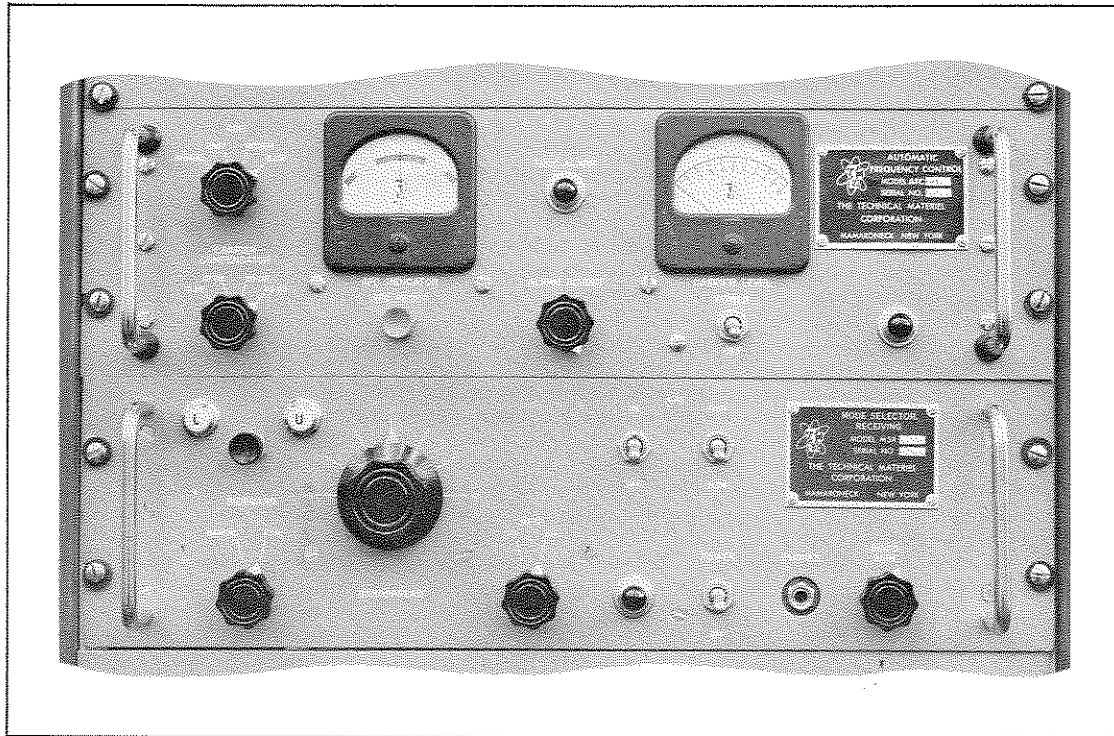


## SALES SERVICE BULLETIN NUMBER 246A

Automatic Frequency Control System

Model AFS-1



The TMC Model AFS-1 is a phase conscious automatic frequency control system which will compensate for transmitter and receiver drift. Error correction to better than  $\pm 1$  cycle is provided. The system may be used with suppressed carrier sideband transmissions with up to 30 db carrier suppression. The AFS-1 was designed to allow the use of receivers such as the R-390/UR or the crystal controlled GPR-90RX (R-840/URR) on circuits where narrow band (85 cps) FSK voice frequency telegraph is being used.

The AFS-1 has a capture range of  $\pm 10$  cps and a hold-in range of  $\pm 1000$  cps. In order to fully utilize this hold-in range, an electronic "memory" circuit is incorporated. If, for example, a signal which has drifted near the limit of the hold-in range should momentarily fade, an ordinary AFC would return to a neutral position. When the signal returned it would be beyond the capture range, hence the AFC would not synchronize. The AFS-1 "memory" circuit delays the AFC from returning to a neutral position and effectively holds the correction for approximately 30 seconds.

The automatic gain control of the system may be derived from the suppressed carrier or the sideband. A front panel switch allows for several AGC time constants, FAST, MEDIUM and SLOW for various circuit conditions.

The Model AFS-1 is composed of two TMC equipments, the Model AFC-1, Automatic Frequency Control and the Model MSR-6, Receiving Mode Selector. Where necessary, this bulletin lists individual Technical Specifications for each unit.

## TECHNICAL SPECIFICATIONS:

Types of Reception: Selectable sideband with carrier suppression of 10, 20 or 30 db.

With AFC-1 disabled the following are available - AM, SSB, CW, MCW.

Sideband Selection: Upper or lower sideband by means of crystal or calibrated bandspread oscillator, controlled by AFC-1.

Input Frequency Range: 452 - 458 Kc.

Input Voltage Range: 0.1 to 10 volts RMS

Input Impedance: 240 K ohms.

Filter Characteristics: 3.2 Kc at 3 db points  
5.2 Kc at 45 db points

AVC Speeds: AFC-1 Fast, Medium, Slow  
MSR-6 Fast, Slow

AFC Capture Range:  $\pm 10$  cycles

AFC Lock Range: Will maintain synchronism for  $\pm 1000$  cps drift at a maximum drift rate of 50 cps per second.

Audio Output: High Level 2 watts  
Low Level 0 dbm  
150 mw

Output Impedances: Loudspeaker 8 ohms  
Line 600 ohms  
Headset High or Low

Metering: AFC-1 Drift Indicator.  
Carrier Level Indicator.  
MSR-6 Upper/Lower Sideband Indicator.

MSR-6 Front Panel Controls: Power ON/OFF  
AUDIO GAIN control  
Sideband UPPER/LOWER switch  
MANUAL/XTAL switch  
BANDSPREAD control  
AVC ON/OFF switch  
BFO ON/OFF switch  
AVC FAST/SLOW switch  
PHONES jack  
Sideband Indicator Lighting  
Power Indicator

AFC-1 Front Panel Controls: Power ON/OFF  
AFC RESET  
AGC SELECT  
Fade ALARM ADJUST  
CARRIER COMPENSATOR

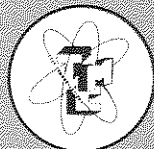
	Fade Alarm Indicator
	Power Indicator
MSR-6 Rear Panel Facilities:	IF Input jack
	Threshold controls
	AC Power Input
	Audio output terminals
	AFC Terminal
	HI/LO output level control
	17 Kc carrier output jack
	17 Kc reference input jack
AFC-1 Rear Panel Facilities:	Carrier input jack
	17 Kc reference output jack
	AFC output terminal
	AGC output terminal
	Remote fade alarm output
	AC power input
Power Requirements:	105/115/125/210/230 volts
	50 - 60 cps
	Single Phase
	110 watts
Size and Weight:	
AFC-1	25 lbs. net
MSR-6	25 lbs. net
AFS-1	50 lbs. net
AFC-1	5-1/4" high x 19" wide x 11-1/4" deep.
MSR-6	5-1/4" high x 19" wide x 11-1/4" deep.
AFS-1	Gross shipping weight, case packed, 120 lbs. 24-1/2" x 19-1/2" x 23"
Mounting:	Standard 19" relay rack
MSR-6 Tube Complement:	12AU7 Relay driver
	12AT7 Amplifier & Oscillator
	12AU7 17 Kc Oscillator & Audio Amplifier
	6J6 Reactance tube
	6AG5 1st Oscillator
	6BA6 IF Amplifier
	6BE6 1st Mixer
	6BE6 2nd Mixer
	6AQ5 Audio Power Amplifier
	5Y3 Power Rectifier
	OA2 Voltage Regulator
AFC-1 Tube Complement:	6AU6 1st Carrier Amplifier
	6AU6 2nd Carrier Amplifier
	12AX7 Limiter
	6U8 17 Kc Amplifier/Phase detector amplifier
	12AX7 17 Kc xtal oscillator
	12AL5 Carrier Rectifier
	12AU7 Memory lock & fade alarm
	6AG5 Constant current pentode
	6AB4 Memory follower
	OA2 +150 v voltage regulator
	OA2 -150 v voltage regulator
Components & Construction:	All equipment manufactured in accordance with JAN/MIL Specifications wherever practicable.

# THE TECHNICAL MATERIEL CORPORATION

700 FENIMORE ROAD

MAMARONECK, NEW YORK

CABLE  
TEPEI  
MAMARONECK, N.Y.



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